**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Activity 5.1C**

**Directions:**

* **Each person should get a penny**
* **Perform the experiment below, add your data to the class data on the front board, and then answer the questions**

1. When you flip a penny 10 times, how many heads SHOULD you get?
2. Will you definitely get this amount of heads (that you said in #1) every time you flip a coin 10 times?
3. What about when you flip a penny 20 times? How many heads SHOULD you get?
4. How about 30 times? 40 times?
5. What PERCENT of heads SHOULD you get whenever you flip a penny numerous times?
6. Again, are you always going to get this percent (50%) every time you flip a penny numerous times? Why not?
7. So, if I have everyone in the class flip a penny 20 times and count the percent of heads, will they all get 50% every time?
8. Hopefully you answered NO!!! So what WILL they get??? What is the **range** of percents of heads they can get if they flip a penny 20 times?

*(hint: think about what the percent would be if they got 0 heads, or 1 head, or 2 heads…. Up to 20 heads)*

1. Would you expect a lot of your classmates to get 10% or 20% or 30% heads?
2. How about 70%, or 80% or 90% heads? Would you expect a lot of your classmates to get these percents?
3. What range do you expect most of the class to be in for their percent of heads in 20 flips? In other words, where would MOST of the class’ percents of heads lie? Between….
4. If we had everyone flip their penny 20 times and record the number of heads, and then recorded all their percentages on a dotplot, what would you EXPECT the dotplot to look like? Sketch it below!

***THE EXPERIMENT:***

* Flip your coin 20 times and record the number of heads on the recording area below.
* Then calculate the percentage of HEADS that you got (do this by taking the total # of heads ÷20, and then converting this to a percent. Example: 12 heads. So 13 ÷ 20 = 0.65, so that’s 65%)
* Do this experiment 3 times.
* Record your 3 numbers on the board

TRIAL #1 TRIAL #2 TRIAL #3

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| HEADS | TAILS |  | HEADS | TAILS |  | HEADS | TAILS |
|  |  |  |  |  |  |  |  |

% of HEADS= \_\_\_\_\_\_\_\_\_\_ % of HEADS= \_\_\_\_\_\_\_\_\_\_\_ % of HEADS= \_\_\_\_\_\_\_\_\_\_\_\_\_\_

***RESULTS:***

1. Put the class data into your calculator into L1. Create a histogram of the class data. Make your X-axis start at 0, and go to 100. Make your bar width 5. Make your Y-minimum -5. You will decide your y-maximum. Your Y-scale should be 1. Create your histogram below (don’t just sketch, be accurate). Be sure to label your axis with both numbers and the names of the variables.
2. Describe the shape of the histogram.
3. Is it the shape you predicted above (in question #13)?
4. What SHOULD the mean will be for the % of heads flipped?
5. What SHOULD the median will be for the % of heads flipped?
6. Find the 1-var stats for the class data:

Mean = \_\_\_\_\_\_\_ Q1 = \_\_\_\_\_\_\_\_\_

Std. dev = \_\_\_\_\_\_\_ Median = \_\_\_\_\_\_\_\_

N = \_\_\_\_\_\_\_\_ Q3 = \_\_\_\_\_\_\_\_

Min = \_\_\_\_\_\_\_ Max = \_\_\_\_\_\_\_\_

1. Was the average close to what it should be (50%)?
2. Test for outliers using the 1.5 x IQR test. List any you find.
3. List the following:

Mean = \_\_\_\_\_\_\_\_\_ Std. Dev. = \_\_\_\_\_\_\_\_\_\_\_

1. What is the range of the mean 1 standard deviation? (take the mean and subtract 1 std. dev, and take the mean and add 1 std. dev.)
2. Count how many observations fall within this range. (it may help to sort your list in ascending order first)
3. What ***PERCENT*** of observations fall within 1 standard deviation of the mean? (change your answer in #23 to a percent by dividing it by the total number of observations, which is your N from your 1-var stats)
4. Is this close to what it should be (68%)??
5. Do the same thing for the mean ± 2 std. deviations. Find the mean ± 2s, find the number of observations in that range, then find the percent of observations in that range.
6. Is this close to what it should be (95%)??
7. What were some sources of bias or error in this experiment?